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BOOK NOTICES.

Altitude, Azimuth, and Geographical Position. By G. W. Littlehales. (Philadelphia, J. B. Lippincott Company.)

It is the idea of latitude and longitude, by means of which the location of any place with reference to any other place is determined with mathematical exactness, that underlies all geographical science and that provides the only method by which geographical descriptions may be made accurate. This is especially true of navigation. For here it is necessary that the latitude and longitude of the vessel be known in order to determine the course to be steered to reach the port of destination, or in other words it is essential for the navigator to find, by astronomical observations, where his vessel is with reference to base-lines, like the equator and the first meridian, before he can determine how to proceed.

A geographical map or chart is a graphical tabulation of geographical positions, or latitudes and longitudes of places, by means of which the necessity is obviated for having recourse to the application of the principles of spherical trigonometry and to lengthy numerical computation, whenever we wish to find the direction or azimuth of one place from another and the distance from place to place; and as the geographical map is a graphical tabulation of geographical positions, so this magnificent volume, in which Mr. Littlehales has performed a gigantic labour for the advancement of one of the most useful of the exact sciences, is a tabulation of the results which are requisite for a direct and speedy determination of geographical position and azimuth from the simple astronomical observation of measuring the altitude of a celestial body, which mariners have been used to taking for many generations the world over.

And so the navigator finds the indispensable latitude and longitude and the course to be steered to reach his port of destination by a graphical process easy to understand and to follow, not requiring trigonometry or logarithms, time-saving, brief, simple, infallible. "The subject," remarks the author, "of identifying the celestial body that has been observed, and of simultaneously finding the true bearing and the Sumner line of geographical position with as much precision as astronomical observation taken at sea will warrant, is here treated as if the co-ordinates of the celestial sphere had been tabulated from minute to minute of arc throughout the whole circuit of the heavens, in such a manner that the table, being entered with the estimated latitude of the observer and the declination and hour-angle of the observed celestial body, would give the corresponding altitude and azimuth of the observed body."

In place of the multiplicity of rules and formulas which compose the extended array of works on astronomical navigation, Mr. Littlehales has substituted a single, short rule, applicable alike to observations of all celestial bodies and all situations of the observer, and has doubtless become the author of an instrumentality which is destined to exercise a remoulding influence in the practice of the art of navigation, by lessening labour in this respect, by limiting the chances of error, and by enlarging the field out of which comes the demand upon workers in the lower ranks of science and industry to furnish recruits for occupations that require more skill and yield better rewards.

The "Sumner Line" for Position, originated by Captain Sumner, a man who will ever take rank with Bowditch as a master in the Science of Navigation, has now become almost universally adopted by the seaman; but as it takes nearly double the time to calculate the results of an observation of a celestial body as compared with an ordinary "Time Sight," our navigators are inclined to use it sparingly, notwithstanding the greater certainty added to their calculations by its use. The shorter method of projecting the Sumner Line, given by Mr. Littlehales in his "Altitude, Azimuth, and Geographical Position," will save much time, labour, and eyesight at critical periods when moments are golden. But this method must be particularly welcomed by that class of navigators who seek to check every observation they make by securing several lines of bearing from the same celestial body, or who, by beginning in the early twilight of the day, when the sky is clear and the horizon well defined, observe the altitudes of two or more of the "Stellar Light Houses of the Sky" and provide themselves for the "Day's Work," not only one or two, but four or five positions for checking their computations, before pushing a vessel through fogs and dangers unseen, at the great rate of speed now common to steamship navigation.

A line run through five points thus computed will establish it with mathematical accuracy, and the scientific navigator, who has the enormous interests now sent to sea in one compact body consigned to his charge, cannot be satisfied with less assurance of perfect results than is given by the best work possible to attain. In such navigation, where the saving of numerical computations is augmented four and five times, possible in the Littlehales method, his work will prove a friend indeed.

In the Navy, particularly, where the navigator not only has the lives of his shipmates at stake but takes upon himself, for the ten and twelve million dollar battleships on which he sails, the care that is represented in the insurance risks that great corporations handle for the merchant ships, perfection in the art of navigation will take no second place to any other factor that enters into the use of one of the most costly structures owned by the Government. By such perfect means only can a ship be safely piloted through intricate channels, such as confronted our Navy during the late Spanish-American war in the West Indies, where the lighthouses were unlighted and other aids to navigation destroyed, while our scouting vessels were rushing at great speed to secure a military advantage of the enemy.

At such times as these Mr. Littlehales' method will be appreciated by the weary and anxious navigator who must work quickly and surely; but it should be remembered that here the maxim "In times of Peace prepare for War" has its strongest bearing, for without constant practice in the quieter moments of a seafaring life, confidence, which is so essential for good navigation, cannot be attained.

CH.

The American Scene. By Henry James. vi+443. Harper & Bros., 1907.

There may be something to be gained by a careful reading of this book, if one has the leisure to unravel its tangled phrases. The ordinary reader, however, is repelled by simply glancing through it. Heaviness and verbosity are written only too clearly upon the long, closely-lined pages. One looks in vain for the clear-cut prose "vignettes" and the beautiful illustrations which adorn the recent edition of "English Hours."